

CLAIMS

1. A composition comprising: (a) outer-membrane vesicles prepared from a first strain of *Neisseria meningitidis*; and (b) one or more proteins which are present in outer-membrane vesicles prepared from a second strain of *Neisseria meningitidis*, but which are not present in outer-membrane vesicles prepared from said first strain.
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2. The composition of claim 1, wherein the protein(s) of component (b) are: (i) purified from the second strain and added to component (a); (ii) expressed recombinantly, purified, and added to component (a); or (iii) expressed by said first strain following either engineering of the first strain such that it expresses said protein(s), either (1) from its chromosomal DNA or from
10 extrachromosomal DNA, or (2) such that existing expression of said protein(s) is up-regulated, or (3) such that trafficking of said protein(s) already expressed by the first strain is altered to direct it/them to a different cellular location, thereby causing it/them to be present in the outer-membrane vesicles.
3. A composition according to claim 1, comprising outer-membrane vesicles (OMVs) prepared
15 from a genetically-modified first strain of *Neisseria meningitidis*, wherein said OMVs include one or more proteins which are (a) not present in OMVs prepared from said first strain prior to its being genetically modified, but which are (b) present in OMVs prepared from a second strain of *Neisseria meningitidis*.
4. The composition of claim 3, wherein the one or more protein(s) are selected from the following
20 proteins disclosed by Tettelin *et al.* [*Science* (2000) 287:1809-1815] and deposited in the sequence databases as: NMB0007, NMB0018, NMB0031, NMB0035, NMB0051, NMB0052, NMB0088, NMB0089, NMB0109, NMB0110, NMB0124, NMB0126, NMB0130, NMB0132, NMB0138, NMB0139, NMB0143, NMB0154, NMB0157, NMB0168, NMB0171, NMB0182, NMB0204, NMB0214, NMB0219, NMB0280, NMB0313, NMB0336, NMB0359, NMB0375, NMB0382, NMB0387, NMB0410, NMB0423, NMB0426, NMB0427, NMB0461, NMB0462, NMB0477, NMB0546, NMB0554, NMB0586, NMB0595, NMB0604, NMB0610, NMB0617, NMB0618, NMB0623, NMB0626, NMB0631, NMB0634, NMB0638, NMB0652, NMB0663, NMB0703, NMB0757, NMB0758, NMB0763, NMB0787, NMB0854, NMB0875, NMB0876, NMB0889, NMB0920, NMB0943, NMB0944, NMB0946, NMB0954, NMB0955, NMB0957, NMB0959, NMB0983, NMB1011, NMB1046, NMB1053, NMB1055, NMB1124, NMB1126, NMB1127, NMB1131, NMB1153; NMB1162, NMB1164, NMB1165, NMB1191, NMB1199, NMB1201, NMB1228, NMB1240, NMB1252, NMB1285, NMB1301, NMB1313, NMB1323, NMB1332, NMB1339, NMB1341, NMB1342, NMB1358, NMB1392, NMB1429, NMB1437, NMB1445, NMB1457, NMB1460, NMB1497, NMB1506, NMB1518, NMB1533, NMB1540, NMB1554, NMB1567, NMB1572, NMB1574, NMB1576, NMB1577, NMB1594, NMB1612, NMB1642, NMB1668, NMB1684, NMB1710, NMB1714, NMB1762, NMB1796, NMB1799, NMB1808, NMB1812, NMB1849, NMB1854, NMB1855, NMB1861, NMB1869, NMB1874, NMB1903, NMB1921, NMB1934, NMB1936, NMB1946, NMB1949, NMB1953, NMB1969, NMB1972, NMB1988, NMB1998, NMB2039, NMB2069,
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NMB2086, NMB2096, NMB2101, NMB2102, NMB2103, NMB2129, NMB2134, NMB2138, NMB2154 and NMB2159.

5. The composition of claim 4, wherein the one or more proteins are selected from: NMB0182, NMB0382, NMB0634, NMB0763, NMB1126, NMB1342, NMB1429, NMB1799 and NMB2039.
6. A lipid bilayer which includes a protein selected from: (i) a protein comprising an amino acid sequence selected from the group consisting of SEQ ID NO^s: 1 to 217; (ii) a protein comprising an amino acid sequence which shares at least 50% sequence identity with an amino acid sequence selected from the group consisting of SEQ ID NO^s: 1 to 217; (iii) a protein comprising a fragment of an amino acid sequence selected from the group consisting of SEQ ID NO^s: 1 to 217, wherein the fragment comprises at least 7 consecutive amino acids from the sequence; and/or (iv) a hybrid protein of formula: NH₂-A-[-X-L-]_n-B-COOH, wherein X is the amino acid sequence as defined in any one of (i) to (iii), L is an optional linker amino acid sequence, A is an optional N-terminal amino acid sequence, B is an optional C-terminal amino acid sequence, and n is an integer greater than 1.
7. The lipid bilayer of claim 6, in the form of a cell membrane, a liposome, a bacterial ghost, an outer membrane vesicle or a bleb.
8. The lipid bilayer of claim 6 or claim 7, which does not include at least one of the following native membrane components: a porin; lipooligosaccharide; lipopolysaccharide; PilC protein; Omp85 protein; an opacity proteins; a pilin; or P64k.
9. A protein comprising an amino acid sequence selected from the group consisting of SEQ ID NO^s: 1 to 217.
10. A protein comprising an amino acid sequence which shares at least 50% sequence identity with an amino acid sequence selected from the group consisting of SEQ ID NO^s: 1 to 217.
- 25 11. A protein comprising a fragment of an amino acid sequence selected from the group consisting of SEQ ID NO^s: 1 to 217, wherein the fragment comprises at least 7 consecutive amino acids from the sequence.
- 30 12. A hybrid protein of formula: NH₂-A-[-X-L-]_n-B-COOH, wherein X is the amino acid sequence as defined in any one of claims 1 to 3, L is an optional linker amino acid sequence, A is an optional N-terminal amino acid sequence, B is an optional C-terminal amino acid sequence, and n is an integer greater than 1.
13. Nucleic acid encoding the protein of any one of claims 9 to 12.